

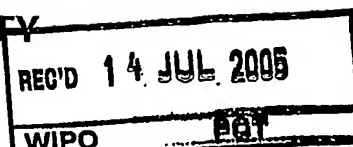
## PATENT COOPERATION TREATY



PCT

## INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

(Chapter II of the Patent Cooperation Treaty)

(PCT Article 36 and Rule 70)



Applicant's or agent's file reference	<b>FOR FURTHER ACTION</b> See Form PCT/PEA/416	
International application No. PCT/ZA2004/000041	International filing date (day/month/year) 07.04.2004	Priority date (day/month/year) 11.04.2003
International Patent Classification (IPC) or national classification and IPC C10L1/02, C10L1/04, C10L1/06, C10L1/08, C10G2/00		
Applicant SASOL TECHNOLOGY (PTY) LTD et al.		
<p>1. This report is the international preliminary examination report, established by this International Preliminary Examining Authority under Article 35 and transmitted to the applicant according to Article 36.</p> <p>2. This REPORT consists of a total of 4 sheets, including this cover sheet.</p> <p>3. This report is also accompanied by ANNEXES, comprising:</p> <p>a. <input checked="" type="checkbox"/> sent to the applicant and to the International Bureau a total of 2 sheets, as follows:</p> <p style="margin-left: 40px;"><input checked="" type="checkbox"/> sheets of the description, claims and/or drawings which have been amended and are the basis of this report and/or sheets containing rectifications authorized by this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions).</p> <p style="margin-left: 40px;"><input type="checkbox"/> sheets which supersede earlier sheets, but which this Authority considers contain an amendment that goes beyond the disclosure in the international application as filed, as indicated in item 4 of Box No. I and the Supplemental Box.</p> <p>b. <input type="checkbox"/> (sent to the International Bureau only) a total of (Indicate type and number of electronic carrier(s)) , containing a sequence listing and/or tables related thereto, in computer readable form only, as indicated in the Supplemental Box Relating to Sequence Listing (see Section 802 of the Administrative Instructions).</p>		
<p>4. This report contains indications relating to the following items:</p> <p><input checked="" type="checkbox"/> Box No. I Basis of the opinion</p> <p><input type="checkbox"/> Box No. II Priority</p> <p><input type="checkbox"/> Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability</p> <p><input type="checkbox"/> Box No. IV Lack of unity of invention</p> <p><input checked="" type="checkbox"/> Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement</p> <p><input type="checkbox"/> Box No. VI Certain documents cited</p> <p><input type="checkbox"/> Box No. VII Certain defects in the international application</p> <p><input type="checkbox"/> Box No. VIII Certain observations on the international application</p>		
Date of submission of the demand  08.11.2004	Date of completion of this report  14.07.2005	
Name and mailing address of the international preliminary examining authority:   European Patent Office - P.B. 5818 Patentlaan 2 NL-2280 HV Rijswijk - Pays Bas Tel. +31 70 340 - 2040 Tx: 31 651 epo nl Fax: +31 70 340 - 3016	Authorized Officer  Gilliquet, J-N  Telephone No. +31 70 340-4573  	

**INTERNATIONAL PRELIMINARY REPORT  
ON PATENTABILITY**

International application No.  
PCT/ZA2004/000041

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**Box No. I Basis of the report**

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1. With regard to the **language**, this report is based on the international application in the language in which it was filed, unless otherwise indicated under this item.
- ☐ This report is based on translations from the original language into the following language , which is the language of a translation furnished for the purposes of:
- ☐ international search (under Rules 12.3 and 23.1(b))
  - ☐ publication of the international application (under Rule 12.4)
  - ☐ international preliminary examination (under Rules 55.2 and/or 55.3)
2. With regard to the **elements\*** of the international application, this report is based on *(replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report)*:

**Description, Pages**

1-28 as originally filed

**Claims, Numbers**

1-14 filed with telefax on 08.06.2005

- ☐ a sequence listing and/or any related table(s) - see Supplemental Box Relating to Sequence Listing
3. ☐ The amendments have resulted in the cancellation of:
- ☐ the description, pages
  - ☐ the claims, Nos.
  - ☐ the drawings, sheets/figs
  - ☐ the sequence listing (*specify*):
  - ☐ any table(s) related to sequence listing (*specify*):
4. ☐ This report has been established as if (some of) the amendments annexed to this report and listed below had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).
- ☐ the description, pages
  - ☐ the claims, Nos.
  - ☐ the drawings, sheets/figs
  - ☐ the sequence listing (*specify*):
  - ☐ any table(s) related to sequence listing (*specify*):

\* If item 4 applies, some or all of these sheets may be marked "superseded."

**INTERNATIONAL PRELIMINARY REPORT  
ON PATENTABILITY**

International application No.  
PCT/ZA2004/000041

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**Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**

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**1. Statement**

Novelty (N)	Yes: Claims	
	No: Claims	1-14
Inventive step (IS)	Yes: Claims	
	No: Claims	1-14
Industrial applicability (IA)	Yes: Claims	1-14
	No: Claims	

**2. Citations and explanations (Rule 70.7):**

**see separate sheet**

**Re Item V.**

- 1 The following document is referred to in this communication:

D1: US-B-6 310 1081 (BONNEAU REYNALD ET AL) 30 October 2001 (2001-10-30)

**2 INDEPENDENT CLAIM 1**

- 2.1 The present application does not meet the criteria of Article 33(1) PCT, because the subject-matter of claim 1 is not new in the sense of Article 33(2) PCT.

Document D1 (see example 1, col.2 §2 and col.10 §2 of D1) discloses a process for the production of a synthetic low sulphur diesel fuel and a low soot emission aviation fuel from a Low Temperature (down to 150 °C) Fischer-Tropsch feedstock into a light kerosene fraction and a heavier diesel fraction in a mass ratio of 1:2 to form the light kerosene fraction useable as a low soot emission aviation fuel and the heavier diesel fraction useable as a synthetic low sulphur diesel fuel, said fractions substantially complying with diesel and aviation fuel specifications.

- 2.2 Document D1 does not list the properties of the light kerosene fraction nor of the heavier diesel fraction but they are implicit as these products come from the same process as in present application.

**3 DEPENDENT CLAIMS**

- 3.1 The features claimed in the dependent claims are standard options offered to the skilled person in the art or intrinsic properties of fuels. Moreover, from the text of the description of the present application, their subject-matter does not contribute to solving the technical problem posed in the application. Therefore it does not involve an inventive step in the sense of Article 33(3) PCT.

**Claims**

1. A process for the production of a synthetic low sulphur diesel fuel and a low soot emission aviation fuel from a Low Temperature Fischer-Tropsch (LTFT) feedstock, said process including the fractionation of the Low Temperature Fischer-Tropsch feedstock into a light kerosene fraction and a heavier diesel fraction in a volumetric ratio of at least 1:2 to form the light kerosene fraction having a smoke point greater than 50 mm, a freezing point of below -47°C, a BOCLE lubricity wear scar less than 0.85 mm, and an anti-oxidant additiveless thermal stability tube deposit rating at 260°C of less than 1 useable as a low soot emission aviation fuel and/or an aviation fuel blend stock, and the heavier diesel fraction having CFPP according to IP309 of below -5°C, a density@20°C of at least 0.78 kg/l, and a viscosity@40°C of above 2 cSt useable as a synthetic low sulphur diesel fuel and/or a diesel fuel blend stock.
2. A process as claimed in claim 1, wherein at least 33 volume% of the LTFT feedstock is separated to form said aviation fuel or blending stock having a final boiling point of about 270°C.
3. A process as claimed in claim 1 or claim 2, wherein the process includes fractionation and removal of 45 volume%, of the feedstock to form said aviation fuel or blending stock.
4. A process as claimed in claim 3, wherein the process includes the fractionation and removal of 55 volume% of the feedstock.
5. A process as claimed in any one of claims 1 to 3, wherein the light kerosene fraction has a density@20°C of at least 0.75 kg/l.
6. A process as claimed in any one of the preceding claims, wherein the light kerosene fraction produced by the process has An iso:n paraffins mass ratio of from 1:1 to 1:2.

7. A process as claimed in any one of the preceding claims, wherein the light kerosene fraction produced by the process has an iso:n paraffins mass ratio is from 1 to 2.
- 5 8. A process as claimed in any one of the preceding claims, wherein the light kerosene fraction produced by the process has an iso:n paraffins mass ratio is from 1.16 to 1.2.
9. A process as claimed in any one of the preceding claims, wherein the light kerosene fraction produced by the process has a hydrogen content of from 13 mass% to 17 mass%.
- 10 10. A process as claimed in any one of the preceding claims, wherein the light kerosene fraction produced by the process has a hydrogen content of about 15 mass%.
- 15 11. A process as claimed in any one of the preceding claims, wherein the light kerosene fraction produced by the process is a LTFT kerosene fraction.
- 20 12. A process as claimed in any one of the preceding claims, wherein the light kerosene fraction produced by the process has a viscosity@-20°C of less than 8cSt.
- 25 13. A process as claimed in any one of the preceding claims, wherein the light kerosene fraction produced by the process has a final boiling point of above 200°C, typically about 270°C.
- 30 14. A process as claimed in any one of the preceding claims, wherein the light kerosene fraction produced by the process has Quartz Crystal Microbalance (QCM) deposition of less than 3 µg/cm<sup>2</sup>.

## A. CLASSIFICATION OF SUBJECT MATTER

IPC 7 C10L1/02 C10L1/04 C10L1/06 C10L1/08 C10G2/00

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 C10L C10G

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 6 310 108 B1 (BONNEAU REYNALD ET AL) 30 October 2001 (2001-10-30) column 2, paragraph 2; example 1 ---	1-36
A	WO 00/20534 A (DANCUART LUIS PABLO ; WET EWALD WATERMEYER DE (ZA); HAAN ROBERT DE (ZA) 13 April 2000 (2000-04-13) page 9, paragraph 3 - paragraph 4; tables A,4A,4B --- -/--	1,4,15, 22,25

☒ Further documents are listed in the continuation of box C.☒ Patent family members are listed in annex.

## \* Special categories of cited documents:

- \*A\* document defining the general state of the art which is not considered to be of particular relevance
- \*E\* earlier document but published on or after the international filing date
- \*L\* document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
- \*O\* document referring to an oral disclosure, use, exhibition or other means
- \*P\* document published prior to the international filing date but later than the priority date claimed

- \*T\* later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
- \*X\* document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
- \*Y\* document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.
- \*&\* document member of the same patent family

Date of the actual completion of the international search

20 August 2004

Date of mailing of the international search report

21/09/2004

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Gilliquet, J-N

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT		
Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	<p>ANONYMOUS: "Submission to the Fuel Tax Inquiry" INTERNET ARTICLE, 'Online! 29 September 2001 (2001-09-29), XP002293422 Retrieved from the Internet: &lt;URL:http://fueltaxinquiry.treasury.gov.au /content/Submissions/Industry/Sasol_198.as p&gt; page 1 -page 15</p> <p>---</p>	1,4,15, 22,25
A	<p>PHILLIPS G: "Gasification offers integration opportunities and refinery modernisation" PETROTECH 2001, 'Online! 23 - 30 October 2001, XP002293423 Retrieved from the Internet: &lt;URL:http://www.fosterwheeler.fi/publicati ons/tech_papers/env/pdfs/GP1109.pdf&gt; page 1 -page 15</p> <p>-----</p>	1,4,15, 22,25



## INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/ZA2004/000041

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
US 6310108	B1	30-10-2001	FR 2789691 A1	18-08-2000
			IT MI20000175 A1	06-08-2001
WO 0020534	A	13-04-2000	AU 764502 B2	21-08-2003
			AU 6300099 A	26-04-2000
			EP 1121401 A1	08-08-2001
			JP 2002526636 T	20-08-2002
			WO 0020534 A1	13-04-2000
			ZA 200102750 A	07-07-2002